

TOPTAŞ ENERJİ

BUSINESS PROFILE

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ABOUT US

Toptaş Enerji was founded in 2006 in order to carry out the land surveys, electrical projects, expropriation projects and the construction works of the high and medium voltage power transmission lines and distribution systems in REPUBLIC OF TURKEY and the worldwide. Continues its way with experienced, productive and effective human resources.

Our goal is to make Toptaş Enerji a leading and strong brand in its field. In this process, we consider providing high quality service as well as working with customer satisfaction as one of our most significant tasks.

Fulfilling our commitments on time and within the best quality, overcoming difficult projects requiring expertise, working with qualified and skilled human resources, working despite any difficult conditions, remaining honest while performing our works are our main principles in order to make Toptaş Enerji a pioneer company in the field of high and medium voltage power transmission lines and distribution systems.

Toptaş Enerji uses advanced and modern technologies to realize projects based on power transmission lines and distribution systems, expropriation projects and topographical works for these facilities with collaborating many companies and organizations.

COMPANY INFORMATION

Full Title : Toptaş Enerji Elektrik Sanayi Ticaret ve Limited Şirketi
Founded : 2006
Center : Rızapaşa Sokak, No: 8/1, Kadıköy, İstanbul, TÜRKİYE
Manager : Uygun TOPTAŞ
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GSM : +90 532 475 34 40
Web : www.toptasenerji.com
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ABOUT US

Our company was established in 2006 and following its establishment, as a result of the agreement signed with [YPM Elektrik Üretim A.Ş.](#), “Gölova HEPP - Konak HEPP - Beypinar HEPP - Altuntepe HEPP - Suşehri SS Overhead Transmission Line” has been completed and accepted before the contract date. The length of this line is 45 km in total and the approximate amount of iron processed is 415 tons, along with 230 tons of conductor and 13 km of OPWG conductor.

Our company, which has put its signature under difficult works since its establishment, has been a reliable and robust solution point for both its customers and business partners.

Our Mission

It is our primary duty to provide services without making any concessions from the quality of work, to work to increase the welfare level of our society and humanity by making studies in the field of power transmission lines and distribution systems in REPUBLIC OF TURKEY and the worldwide.

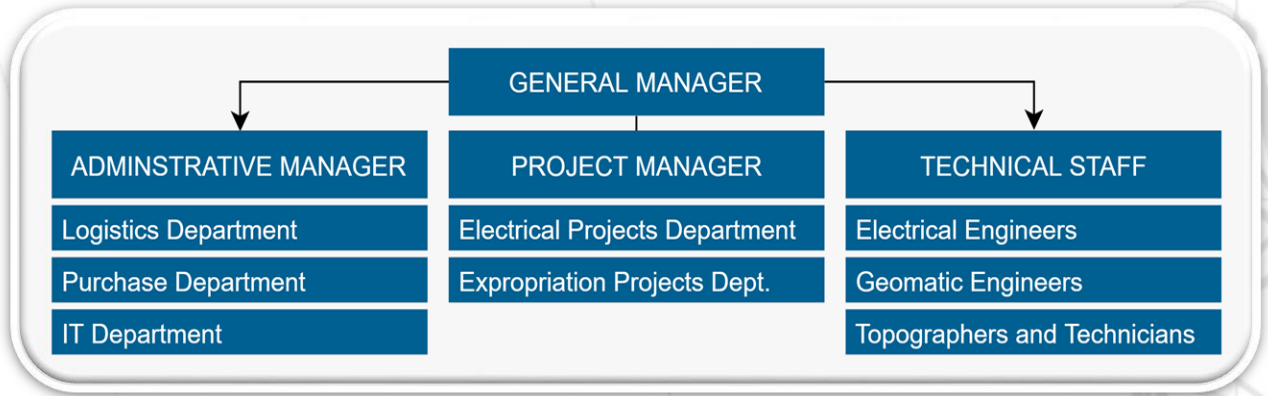
Our Goal

Our most important goal is to make Toptaş Enerji a leading, strong and preferred firm in its field with continuous and consistent development.

Our Principles

-  Being efficient and productive,
-  Always aiming for the best,
-  Focusing on customer satisfactions with saying “Humanity first.”,
-  To provide a high quality service with honest work,
-  Dealing with all kind of works regardless easy or difficult,
-  To have an environmentally sensitive working approach,
-  Not only thinking about the present but the future,
-  Considering the interests of our society and humanity in our works,
-  To follow the innovations and use the latest technologies,
-  Having a scientific approach in all our works,
-  Growing consistently with our business partners.

ORGANIZATIONAL STRUCTURE



OUR TEAM

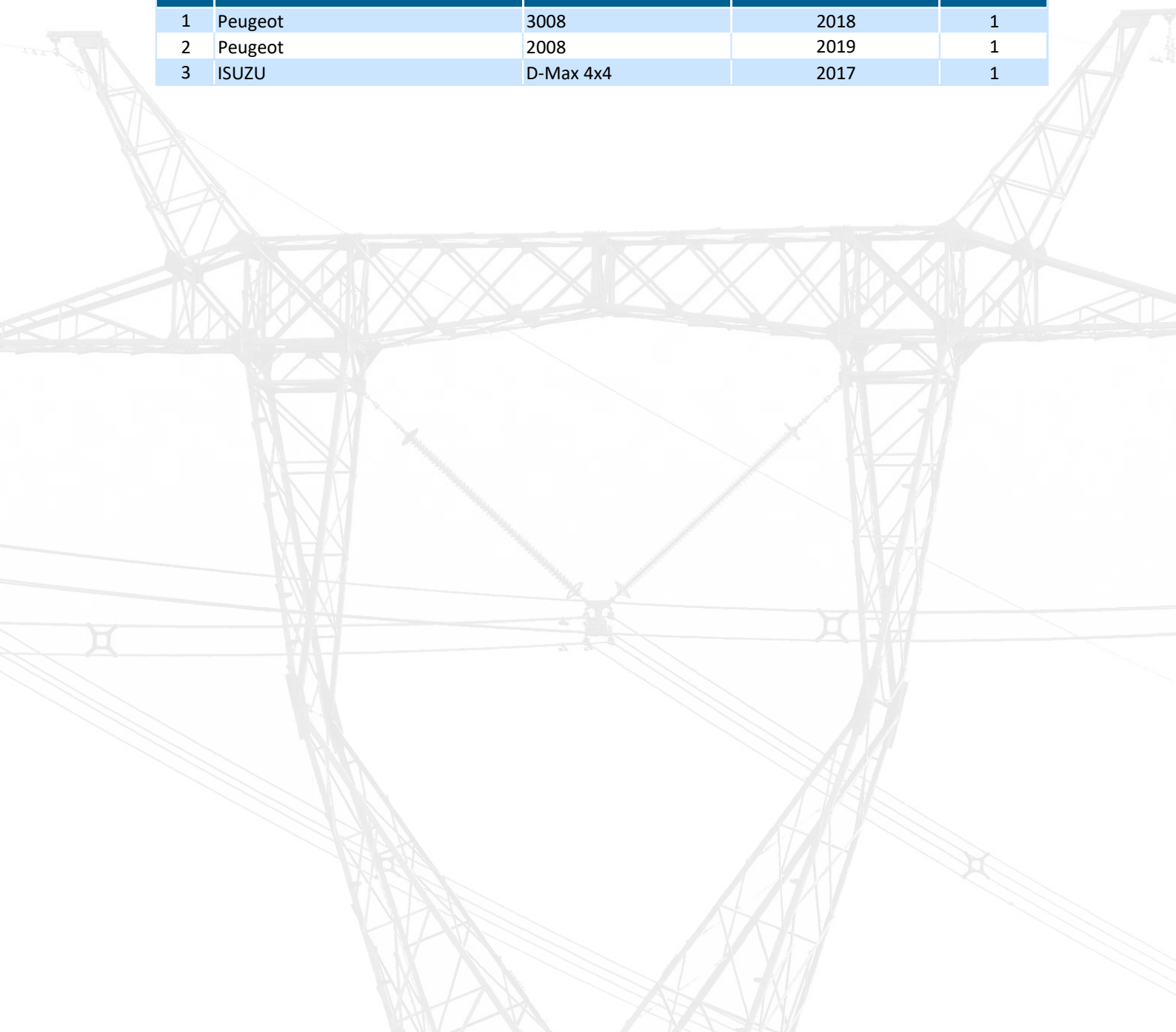
Uygun TOPTAŞ	General Manager
Metin ÖZKUL	Administrative Manager & Head of Purchase Department
Fatih Mehmet TOPTAŞ	Project Manager & Head of Electrical Projects Department Electrical and Electronics Engineer
Tuğçe TOPTAŞ	Head of Expropriation Projects Department Geomatic Engineer
Aybüke TOPTAŞ	Head of IT Department
Atila BAŞARAN	Head of Logistics Department
Semih GÜNEŞ	Geomatic Technician
Gökhan TOPTAŞ	Topographer
Serkan TOPTAŞ	Topographer

OUR EQUIPMENTS

	TYPE	BRAND	MODEL	PCS
1	GNSS (GPS Receiver)	Topcon	Hyper II	6
2	Total Station	Topcon	GPT-3500	3
3	Leveling Device	Leica	Digital Nivo	1
4	Laser Meter	Leica	Disto D3A	2

TRANSPORT VEHICLES

	BRAND	MODEL	YEAR	PCS
1	Peugeot	3008	2018	1
2	Peugeot	2008	2019	1
3	ISUZU	D-Max 4x4	2017	1



OUR COMPLETED JOBS

CONSTRUCTIONS OF 30-36kV OVERHEAD POWER TRANSMISSION LINES			
	NAME	KM	EMPLOYER
1	31.5kV 3x3/0 AWG GÖLOVA HEPP - KONAK HEPP OHTL	4.00	YPM ELEKTRİK ÜRETİM A.Ş.
2	31.5kV 3x477 MCM KONAK HEPP - BEYPINAR HEPP OHTL	3.50	YPM ELEKTRİK ÜRETİM A.Ş.
3	31.5kV 2(3x477) MCM BEYPINAR HEPP - ALTUNTEPE HEPP OHTL	13.00	YPM ELEKTRİK ÜRETİM A.Ş.
4	31.5kV 2(3x477) MCM SEVİNDİK HEPP - ALTUNTEPE HEPP OHTL	1.50	YPM ELEKTRİK ÜRETİM A.Ş.
5	31.5kV 2(3x477) MCM ALTUNTEPE HEPP - SUŞEHİRİ SS OHTL	28.00	YPM ELEKTRİK ÜRETİM A.Ş.
6	34.5kV 2(3x477) MCM ALAKÖPRÜ HEPP - OTLUCA SS OHTL	10.50	ENERSE ENERJİ ÜRETİM A.Ş.
7	34.5kV 2(3x477) MCM KARADAĞ WPP - ÇEŞME HAVZA SS OHTL	11.50	ENERSE ENERJİ ÜRETİM A.Ş.
8	34.5kV 3x3/0 AWG KILCAN HEPP - YENİ DM OHTL	4.00	ENERSE ENERJİ ÜRETİM A.Ş.

DESIGNS OF 154kV - 380kV OVERHEAD POWER TRANSMISSION LINES			
	NAME	KM	EMPLOYER
1	380kV EGEMER 380 SS - TOŞÇELİK 380 SS OHTL	16.00	ZRD MÜHENDİSLİK LTD. ŞTİ.
2	380kV EGEMER 380 SS - ERZİN 380 SS OHTL	16.40	ZRD MÜHENDİSLİK LTD. ŞTİ.
3	154kV MERSİN WPP - GEZENDE HEPP SS OHTL	20.00	AKDENİZ ELEKTRİK ÜRETİM A.Ş.
4	154kV MARDİN ÇİMENTO - PS4 OHTL	5.00	ORHAN GÜLPINAR LTD. ŞTİ.
5	154kV AKHİSAR SS - META NİKEL SS OHTL	30.00	DESAT EGE AKDENİZ LTD. ŞTİ.
6	154kV ÇIRAKDAMI HEPP - ORDU GİRESUN LINE P18 CONNECTION	27.00	ENERGY DANIŞMANLIK VE PROJE
7	154kV DERELİ HEPP - ÇIRAKDAMI HEPP OHTL	5.00	ENERGY DANIŞMANLIK VE PROJE
8	154kV ESKİŞEHİR SS III - ÇİMSA OHTL	12.50	ENERGY DANIŞMANLIK VE PROJE
9	154kV BOZÜYÜK SS - ÇİMSA OHTL	14.50	ENERGY DANIŞMANLIK VE PROJE
10	154kV DARAN HEPP SS - YALNIZARDIÇ SS OHTL	10.40	ARMİN ELEKTRİK A.Ş.
11	154kV EREN HEPP SS - KURŞUNLU KARABÜK OSB SS OHTL	4.00	CENK ENERJİ LTD. ŞTİ.
12	380kV ADAPAZARI ENKA - ADAPAZARI SS OHTL	30.00	USLUEL ENERJİ A.Ş.
13	380kV ADAPAZARI ENKA - SURROUNDING LINES CONNECTION	30.00	USLUEL ENERJİ A.Ş.
14	154kV UŞAK OSB - KIŞLADAĞ OHTL	30.00	USLUEL ENERJİ A.Ş.
15	154kV DÜZCE AKSU HEPP - OSMANCA SS OHTL	22.50	ENERGY DANIŞMANLIK VE PROJE
16	154kV MURAT HEPP SS - ADIÇİM SS OHTL	13.00	MEHMET KOÇAK
17	154kV (TAŞOLUK - HABİBLER) - İSTANBUL GRAND AIRPORT GIS OHTL	6.00	EHA ENERJİ A.O.
18	380kV (YUKARIKALEKÖY - TATVAN SS) - ALPASLAN HEPP II SS OHTL	41.00	MURAT NEHRİ ENERJİ ÜRETİM A.Ş.
19	154kV (SANDIKLI SS - ÇAY SEKA SS) - EBER WPP SS OHTL	12.50	EBER ELEKTRİK ÜRETİM A.Ş.
20	154kV SANDIKLI S - KOCATEPE WPP SS OHTL	15.50	İZDEM ENERJİ ÜRETİM A.Ş.
21	154kV KOVANLIK HEPP - KOVANLIK HAVZA SS OHTL	10.50	KOVANLIK ENERJİ ÜRETİM A.Ş.
22	154kV (AirRES-4 WPP SS - TRAÇİM SS) - VİZE II WPP SS OHTL	3.00	KARAYEL ELEKTRİK ÜRETİM A.Ş.
23	154kV (ASAŞ ALÜMİNYUM SS - SARES SS) - MAV BIOMASS PP SS OHTL	11.50	ENERGY DANIŞMANLIK VE PROJE
24	Northern Marmara Motorway 154-380 kV OHTL Displacement Projects	15 Lines	ICA A.O.
25	Menemen-Aliağa-Çandarlı Motorway 154-380 kV OHTL Displacement Projects	11 Lines	İKA İZMİR OTOYOL YAPIM A.O.
26	Displacement of 154kV TEPEÖREN SS - ŞİLE OHTL	2.00	MURAT ÜLKER & HALUK PEKUZ
27	Countless many other displacement projects		

DESIGNS OF POWER DISTRIBUTION SYSTEMS			
	NAME	POWER (kVA)	EMPLOYER
1	CEZAEVİ 34.5kV DC within Menemen-Aliağa-Çandarlı Motorway Project	-	İKA İZMİR OTOYOL YAPIM A.O.
2	YAŞAR BACARA SOLAR POWER PLANT 34.5kV DC	2500	YAŞAR BACARA
3	SKYWALK FETHİYE 31.5kV METERING DC	-	KİRTUR TURİZM LTD. ŞTİ.
4	SKYWALK FETHİYE 31.5kV/0.4kV SUBSTATION-1	2000	KİRTUR TURİZM LTD. ŞTİ.
5	SKYWALK FETHİYE 31.5kV/0.4kV SUBSTATION-2	1250	KİRTUR TURİZM LTD. ŞTİ.
6	SKYWALK FETHİYE 31.5kV/0.4kV SUBSTATION-3	400	KİRTUR TURİZM LTD. ŞTİ.
7	SKYWALK FETHİYE 0.4kV DISTRIBUTION PANELS	4 PCS	KİRTUR TURİZM LTD. ŞTİ.

OUR COMPLETED JOBS

DESIGNS OF 1kv-36kv OVERHEAD POWER TRANSMISSION LINES			
	NAME	KM	EMPLOYER
1	DİBEKDERERESİ - KIYIKIŞLACAK OHTL	25.00	ETİSAN A.Ş.
2	KIYIKIŞLACIK - AKBÜK OHTL	20.00	DATA ELEKTRİK LTD. ŞTİ.
3	BODRUM SS - GÜMÜŞLÜK OHTL	10.00	ETİSAN A.Ş.
4	BODRUM SS - SURROUNDINGS RING OHTL	12.00	TMT MÜHENDİSLİK LTD. ŞTİ.
5	TURGUTTEPE - MİLAS SS OHTL	20.00	ENERGY DANIŞMANLIK VE PROJE
6	MİLAS SS - BODRUM AIRPORT OHTL	17.00	SEMİH YUVAKURAN
7	DALAMAN SS - KÖYCEĞİZ - DÖĞÜŞBELEN OHTL	30.00	ETİSAN A.Ş.
8	AKYAKA - DÖĞÜŞBELEN OHTL	25.00	ETİSAN A.Ş.
9	ULA - AKYAKA OHTL	10.00	ETİSAN A.Ş.
10	DEMİRCİLER HEPP - MUĞLA SS OHTL	33.00	PAK ENERJİ SAN. TİC. LTD. ŞTİ.
11	KAVAKÇALI HEPP - ULA DC OHTL	32.00	PAK ENERJİ SAN. TİC. LTD. ŞTİ.
12	FETHİYE SS - KEMER DC OHTL	25.00	ETİSAN A.Ş.
13	KEMER DC - SEKİ OHTL	20.00	ETİSAN A.Ş.
14	KEMER DC - PAŞALI OHTL	14.00	ETİSAN A.Ş.
15	MUĞLA SS - MURATLAR OHTL	45.00	ETİSAN A.Ş.
16	İZMİR ULA MORDAĞAN OHTL	22.00	İŞBA LTD. ŞTİ.
17	URLA SS - TÜPRAG OHTL	22.00	TEKMAR MÜH. LTD. ŞTİ.
18	KIRAZ HALİLLER OHTL	15.00	AYDURAN ELEKTRİK LTD. ŞTİ.
19	ALOSBİ SS - CEZAEVİ OHTL	10.00	GÜNEY İLETİŞİM LTD. ŞTİ.
20	ALOSBİ SS - ZEYİNDAGI OHTL	4.00	AYDURAN ELEKTRİK LTD. ŞTİ.
21	TAHTALI SS - GÜMÜLDÜR OHTL	10.00	ELİT MÜHENDİSLİK LTD. ŞTİ.
22	SOMA DC - KARBULAK OHTL	9.00	ELİT MÜHENDİSLİK LTD. ŞTİ.
23	DERBENT SS - GÜNEY OHTL	14.00	ELİT MÜHENDİSLİK LTD. ŞTİ.
24	URLA - SEFERHİSAR OHTL	9.00	ELİT MÜHENDİSLİK LTD. ŞTİ.
25	KORKUTELİ - KIZILDAĞ OHTL	25.00	AYDURAN ELEKTRİK LTD. ŞTİ.
26	AKSU OHTL	14.00	AYDURAN ELEKTRİK LTD. ŞTİ.
27	GÖMBE OHTL	25.00	SEYHUN ERİM LTD. ŞTİ.
28	AFYON SS II - ÇOBANLAR OHTL	30.00	SEYHUN ERİM LTD. ŞTİ.
29	PAPART HEPP - ŞAŞAT OHTL	25.00	ENERGY DANIŞMANLIK VE PROJE
30	TORTUM - PEHLİVANLI OHTL	22.00	DEMİRYÜREKLER A.Ş.
31	ERGANİ - DİCLE OHTL	35.00	ETİSAN A.Ş.
32	YOLBOYU - DEMİRLER OHTL	25.00	ETİSAN A.Ş.
33	MERZİFON SS - SULUOVA OHTL	20.00	ETİSAN A.Ş.
34	GÖLOVA HEPP - SUŞEHİR SS OHTL	45.00	YPM TİCARET VE SANAYİ A.Ş.
35	EGEMER HEPP I-II - BEŞEVLER SS OHTL	22.00	YAZGAN ENERJİ LTD. ŞTİ.
36	ÇEKEREK DAM OHTL DISPLACEMENT PROJECTS	15.00	ELTE MÜHENDİSLİK LTD. ŞTİ.
37	TUZKÖY HEPP - NEVŞEHİR SS OHTL	26.00	ELTE MÜHENDİSLİK LTD. ŞTİ.
38	ASLANLAR SS - SELÇUK OHTL	26.00	İŞBA LTD. ŞTİ.
39	SİVAS DC - YILDIZELİ OHTL	45.00	İŞBA LTD. ŞTİ.
40	KARS SS - SARIKAMIŞ - ÇOBANLAR OHTL	75.00	MASHAR TANRIKULU
41	KARS SS - DİĞOR OHTL	25.00	MASHAR TANRIKULU
42	KARS SS - KAĞIZMAN OHTL	35.00	MASHAR TANRIKULU
43	GÖCEK DC - ÇÖĞMEN OHTL	40.00	ENERJİ MÜHENDİSLİK LTD. ŞTİ.
44	ALAÇATI DC - KADIKÖY OHTL	5.00	ENERJİ MÜHENDİSLİK LTD. ŞTİ.
45	KEMER - PATARA OHTL	30.00	ENERJİ MÜHENDİSLİK LTD. ŞTİ.
46	TAŞKESİK - AĞLASUN OHTL	15.00	SEYHUN ERİM LTD. ŞTİ.
47	VİRANŞEHİR SS - BARDAKÇI OHTL	35.00	SEYHUN ERİM LTD. ŞTİ.
48	GİRESUN AKSU SS - BULANCAK PIRAZİZ OHTL	25.00	ABDULLAH BEY
49	GÖRELE - ÇANAKÇI OHTL	22.00	SABRİ GÜL
50	DATCA - YAZIKÖY OHTL	15.00	ETİSAN A.Ş.

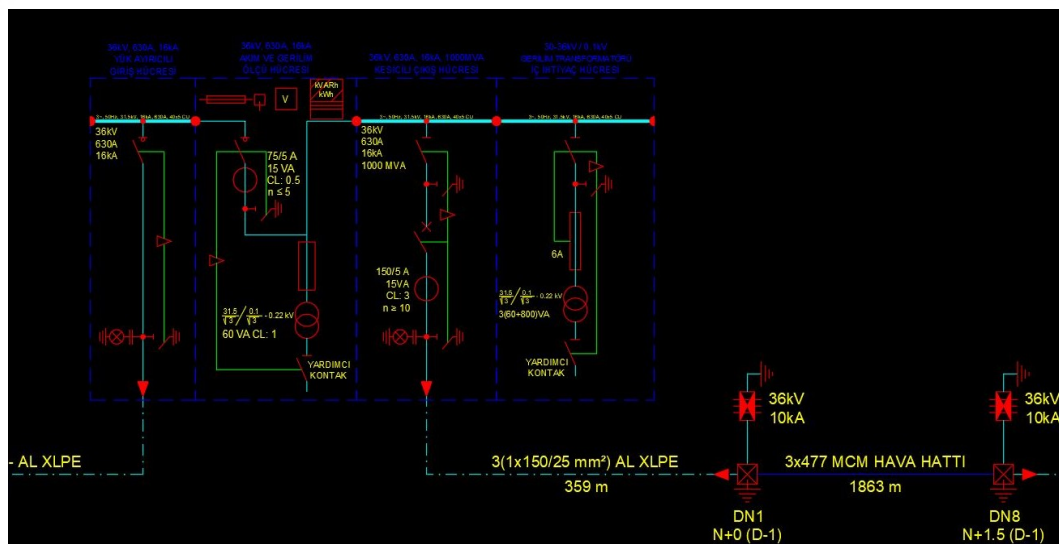
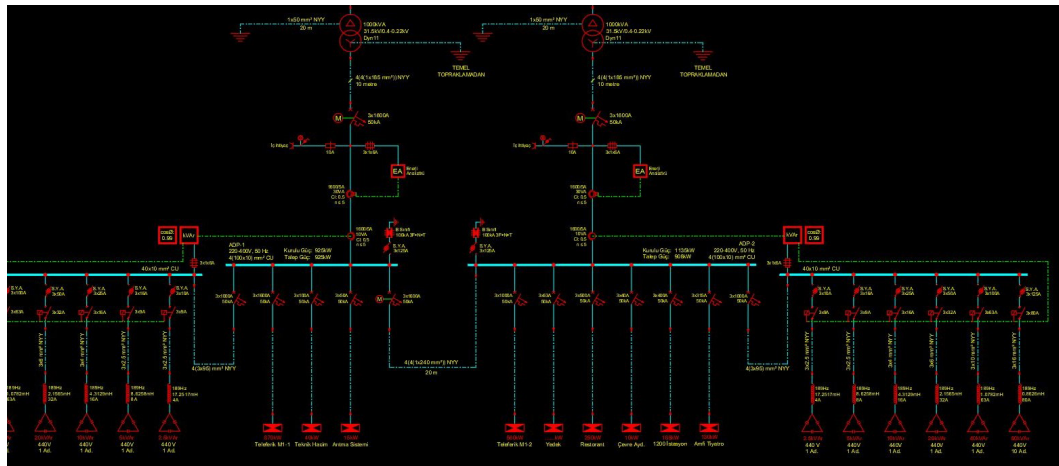


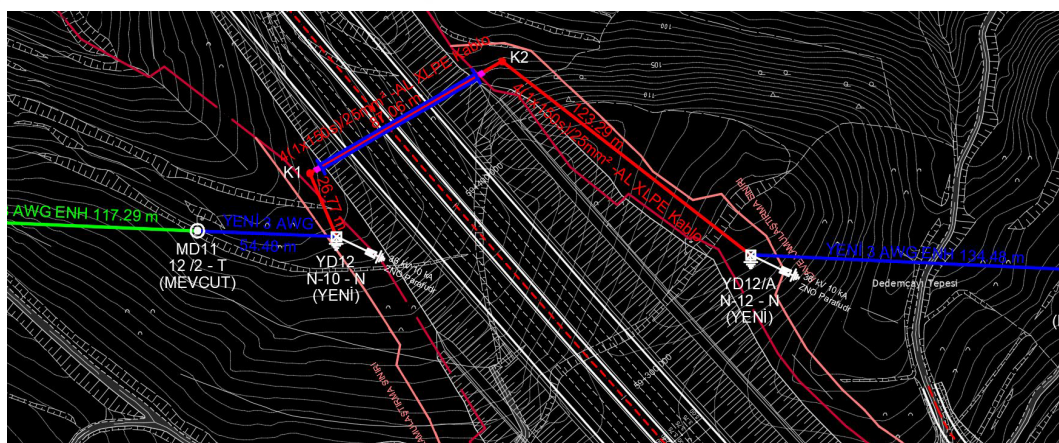
OUR COMPLETED JOBS

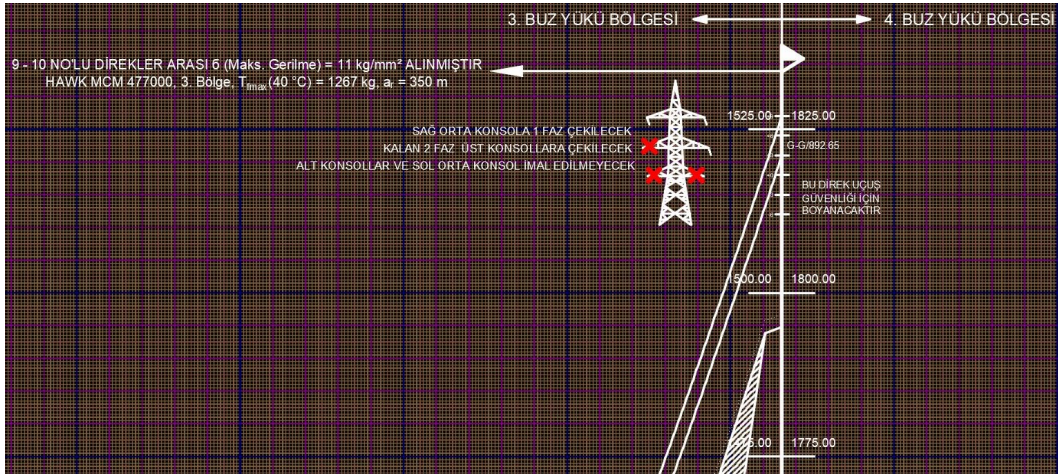
DESIGNS OF 1kv-36kv OVERHEAD POWER TRANSMISSION LINES			
	NAME	KM	EMPLOYER
51	ARALIK DC - NAHÇIVAN OHTL	30.00	ŞA-RA A.Ş.
52	IRAQ SULAYMANIYAH INTERNATIONAL AIRPORT OHTL	20.00	ORHAN GÜLPINAR LTD. ŞTİ.
53	ÇARŞAMBA - TERME OHTL	30.00	
54	TERME - KOCAMAN OHTL	25.00	ÖZKA LTD. ŞTİ.
55	CİVAN WPP - UŞAK OSB OHTL	14.00	ENERGY DANIŞMANLIK VE PROJE
56	ARMİN TOKAT GROUP OHTL WORKS	70.00	ARMİN ELEKTRİK A.Ş.
57	ERCİYES AND SURROUNDINGS OHTL	80.00	ŞAHAN HRT. MÜH. LTD. ŞTİ.
58	MUĞLA ETİSAN 2011 GROUP OHTL WORKS	65.00	ETİSAN A.Ş.
59	KAREL A.Ş. FETHİYE GROUP OHTL WORKS	55.00	KAREL A.Ş.
60	KAREL YUNAK OHTL	25.00	KAREL A.Ş.
61	MEDAŞ 1st GROUP OHTL WORKS	130.00	SEYHUN ERİM LTD. ŞTİ.
62	MEDAŞ 2nd GROUP OHTL WORKS	105.00	ELİT MÜHENDİSLİK LTD. ŞTİ.
63	MEDAŞ 3rd GROUP OHTL WORKS	55.00	İŞBA LTD. ŞTİ.
64	ÇALIK YEDAŞ ÇORUM GROUP OHTL WORKS	135.00	ETİSAN A.Ş.
65	DENİZLİ AKBAŞ HEPP - ADIHÜZEL SS OHTL	22.00	SEZA MÜH. LTD. ŞTİ.
66	ARISU HEPP - MAÇKA SS OHTL	4.00	SEZA MÜH. LTD. ŞTİ.
67	ÜÇGEN HEPP - CANBAZ DC OHTL	11.50	SEZA MÜH. LTD. ŞTİ.
68	ZALA HEPP - ARAÇ DC OHTL	13.40	SEZA MÜH. LTD. ŞTİ.
69	ÖDEMİŞ WPP - TİRE SS OHTL	9.00	ENERGY DANIŞMANLIK VE PROJE
70	SİVAS ÇAMLİBEL EDAŞ 1st, 2nd, 3rd GROUP OHTL WORKS	170.00	ARMİN ELEKTRİK A.Ş.
71	MUĞLA BAYIR - SÖĞÜT OHTL	8.50	YILMAZLAR - ÖZAKSU
72	MUĞLA - KIRAN - DENİZOVA - TURNALI OHTL	5.00	YILMAZLAR - ÖZAKSU
73	İZMİR YENMİŞ DC - ÇAMBAL OHTL	8.00	YILMAZLAR - ÖZAKSU
74	MGÜNEŞ SPP - ÇOĞULHAN DC OHTL	35.00	BÜKOR ELEKTRİK ÜRETİM A.Ş.
75	MENDERES DC - TEKELİ OHTL	8.00	ELİT MÜHENDİSLİK LTD. ŞTİ.
76	ÇETMEN DC - KİPA DC OHTL	4.00	ELİT MÜHENDİSLİK LTD. ŞTİ.
77	YATAĞAN DC - ÇAYBOYU OHTL	30.00	AYDURAN ELEKTRİK LTD. ŞTİ.
78	AKBÜK DC - BOZBURUN OHTL	20.00	AYDURAN ELEKTRİK LTD. ŞTİ.
79	ÇANAKKALE SS - KIRAZLI OHTL	33.00	MSC ENERJİ LTD. ŞTİ.
80	ÇEKEREK HEPP OHTL	70.00	REİS ENERJİ
81	DALYAN DC - DIDİM OHTL	16.00	MET-KA ENERJİ
82	SELÇUK AIRPORT - PAMUCAK OHTL	8.00	MET-KA ENERJİ
83	GÜMÜŞÖREN HEPP - AYŞEPINAR DC OHTL	5.00	BÜKOR ELEKTRİK ÜRETİM A.Ş.
84	EŞME DC - TCDD ANKARA-İZMİR HIGH SPEED TRAIN T1 TUNNEL DC OHTL	14.50	ARMİN ELEKTRİK A.Ş.
85	KOCATEPE WPP T-10 DC - KOCATEPE WPP T-12 DC OHTL (795 MCM)	10.60	İZDEM ENERJİ ÜRETİM A.Ş.
86	(ALÇUK SS - FOÇA I-II) - ILIPINAR SPP DC OHTL	1.40	NES PROJE ELEKTRİK LTD. ŞTİ.
87	TRN ENERJİ SPP - KARAKAYALAR DC OHTL	2.00	NES PROJE ELEKTRİK LTD. ŞTİ.
88	YAŞAR BACARA SPP DC - YAŞAR BACARA OHTL CONNECTION	1.00	YAŞAR BACARA
89	SİLOPİ COAL PP - COAL MINE OHTL	3.00	SİLOPİ ELEKTRİK ÜRETİM A.Ş.
90	OVACIK KIRANÇAĞIL DC - SKYWALK FETHİYE OHTL	3.50	KİRTUR TURİZM LTD. ŞTİ.
91	Menemen-Aliağa-Çandarlı Motorway OHTL Displacement Projects	13 PCS	İKA İZMİR OTOYOL YAPIM A.O.
92	OHTL Projects of many other Solar Power Plants around TURKEY	100.00	

EXPROPRIATION PLANS OF OVERHEAD POWER TRANSMISSION LINES			
	NAME	KM	EMPLOYER
1	30-36kv ALOSBI SS - CEZAEVİ OHTL	10.00	GÜNEY İLETİŞİM LTD. ŞTİ.
2	30-36kv KIYIKIŞLACIK - KAZIKLI OHTL	22.00	DATA ELEKTRİK LTD. ŞTİ.
3	30-36kv DEMİRCİLER HEPP - MUĞLA OHTL	32.00	PAK ENERJİ SAN. TİC. LTD. ŞTİ.
4	30-36kv KAVAKÇALI HEPP - ULA DC OHTL	31.00	PAK ENERJİ SAN. TİC. LTD. ŞTİ.
5	30-36kv GÖCEK DC - ÇÖĞMEN OHTL	28.00	ENERJİ MÜHENDİSLİK LTD. ŞTİ.
6	30-36kv ALAÇATI DC - KADIKÖY OHTL	5.00	ENERJİ MÜHENDİSLİK LTD. ŞTİ.
7	30-36kv TAŞKESİK - HİSARARDI OHTL	5.00	ENERJİ MÜHENDİSLİK LTD. ŞTİ.
8	154kv AKHİSAR SS - META NİKEL OHTL	30.00	DESAT ELEKTRİK TİC. LTD. ŞTİ.
9	30-36kv BEYOBASI HEPP - PAŞALAR DC OHTL	5.00	PAK ENERJİ SAN. TİC. LTD. ŞTİ.
10	30-36kv TURHAL DC - AĞÇAŞAR OHTL & BUZLUK SARIKAYA OHTL	30.00	ARMİN ELEKTRİK A.Ş.









MAGNETIC FLUX PRODUCED BY EACH CONDUCTOR PER UNIT LENGTH

$$\Phi = \iint_S \vec{B} \cdot d\vec{s} = \int_{GMR}^D \int_0^1 \hat{\phi} \frac{\mu_0 I}{2\pi r} \cdot \hat{\phi} dz dr = \frac{\mu_0 I}{2\pi} \int_{GMR}^D \frac{1}{r} dr = \frac{\mu_0 I}{2\pi} \ln\left(\frac{D}{GMR}\right) \text{ [Wb/m]}$$

D: Distance from conductors at any point P.

GMR: Geometrical mean radius of conductors.

Note: Magnetic flux density 'B' can be calculated by using Ampere's Law. ($\vec{\nabla} \times \vec{B} = \mu_0 \vec{J}$)

SELF FLUX LINKAGE OF EACH CONDUCTOR PER UNIT LENGTH

$$\Lambda = N \Phi = N \frac{\mu_0 I}{2\pi} \ln\left(\frac{D}{GMR}\right) = \frac{\mu_0 I}{2\pi} \ln\left(\frac{D}{GMR}\right) \text{ [Wb/m]} \quad \text{N: Number of turns (1 turn).}$$

X Ekseninde Cer Kuvveti Bileşenleri:

$$P_x (3x477MCM) = 6746.40 \text{ kg} \cdot \cos(7.33^\circ) = 6691.27 \text{ kg}$$

$$P_x (3x477MCM) = 1686.60 \text{ kg} \cdot \cos(0.00^\circ) = 1686.60 \text{ kg}$$

$$P_x = (6691.27 \text{ kg}) + (-1686.60 \text{ kg}) = 5004.67 \text{ kg}$$

Y Ekseninde Cer Kuvveti Bileşenleri:

$$P_y (3x477MCM) = 6746.40 \text{ kg} \cdot \sin(7.33^\circ) = 860.73 \text{ kg}$$

$$P_y (3x477MCM) = 1686.60 \text{ kg} \cdot \sin(0.00^\circ) = 0.00 \text{ kg}$$

$$P_y = (860.73 \text{ kg}) + (0.00 \text{ kg}) = 860.73 \text{ kg}$$

XY Ayak Ekseninde Cer Kuvveti Bileşenleri:

$$P_1 (3x477MCM) = 6746.40 \text{ kg} \cdot \cos(37.67^\circ) = 5340.07 \text{ kg}$$

$$P_2 (3x477MCM) = 1686.60 \text{ kg} \cdot \cos(45.00^\circ) = 1192.61 \text{ kg}$$

$$P_{xy} = (5340.07 \text{ kg}) + (-1192.61 \text{ kg}) = 4147.46 \text{ kg}$$

Y'X Ayak Ekseninde Cer Kuvveti Bileşenleri:

$$P_1 (3x477MCM) = 6746.40 \text{ kg} \cdot \sin(37.67^\circ) = 4122.81 \text{ kg}$$

$$P_2 (3x477MCM) = 1686.60 \text{ kg} \cdot \sin(45.00^\circ) = 1192.61 \text{ kg}$$

$$P_{y'x} = (4122.81 \text{ kg}) + (-1192.61 \text{ kg}) = 2930.20 \text{ kg}$$

Sonuç:

Hat Ekseninde Cer Kuvveti Kontrolü:	5004.67 kg < 5397.12 kg	UYGUNDUR
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Ayak Ekseninde Cer Kuvveti Kontrolü:	4147.46 kg < 5164.91 kg	UYGUNDUR
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Direğin sol tertibinin kopması halinde direğin bu kuvvetlere dayanımı uygundur.









